

## REMARKS

This is a full and timely response to the outstanding Office Action mailed October 24, 2001. Reconsideration and allowance of the application and presently pending claims, as amended, are respectfully requested. Upon entry of the amendments in this response, claims 16-34 remain pending in the present application. More specifically, claims 16 and 28 are directly amended. It is believed that the foregoing amendments do not add any new matter to the present application.

### 1. Claim 16

Claim 16 has been rejected under 35 U.S.C. 102(e) as allegedly being anticipated by US patent No. 5,929,524 (*Drynan et al.*). Applicant respectfully traverses this rejection. For a proper rejection of a claim under 35 U.S.C. Section 102, the cited reference must disclose all elements/features/steps of the claim. See, e.g., *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 7 USPQ2d 1129 (Fed. Cir. 1988). Applicant has amended claim 16 as shown above to further distinguish the claimed subject matter from *Drynan*. Applicant respectfully submits that claim 16, as amended, is allowable for at least the reason that it includes the feature: "wherein the dielectric layer has a different composition than the low-k material," a feature that is not taught by *Drynan*. The alleged low-k material and dielectric layer disclosed in *Drynan* are both composed of the same material (BPSG). Therefore, since the cited reference does not disclose all the elements and/or features of claim 16, Applicant respectfully asserts that the rejection should be withdrawn.

### 2. Claims 17-27

Claims 19, 20, and 23 have been rejected under 35 U.S.C. 102(e) as allegedly being anticipated by *Drynan*, whereas claims 17, 18, 21, 22, and 24-27 have been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over *Drynan*. Applicant respectfully traverses these rejections. Because independent claim 16 is believed to be allowable over the prior art of record, dependent claims 17-27 (which depend from independent claim 16) are allowable as a matter of law for at least the reason that each of the

claims 17-27 contains all the elements/features of independent claim 16. See, e.g., *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988).

### **3. Claim 28**

Claim 28 has been rejected under 35 U.S.C. 102(b) as allegedly being anticipated by US patent No. 5,747,880 (*Havemann et al.*). Applicant respectfully traverses this rejection. For a proper rejection of a claim under 35 U.S.C. Section 102, the cited reference must disclose all elements or features of the claim. Applicant has amended claim 28 as shown above to further distinguish the claimed subject matter from *Havemann*. Applicant respectfully submits that claim 28, as amended, is allowable for at least the reason that it includes the feature: “wherein portions of said second dielectric material are formed between portions of said low-k dielectric structures,” a feature that is not taught by *Havemann*. Therefore, since the cited reference does not disclose all the elements and/or features of claim 28, Applicant respectfully asserts that the rejection should be withdrawn.

### **4. Claims 29-33**

Claim 29 has been rejected under 35 U.S.C. 102(b) as allegedly being anticipated by *Havemann*, claims 30 and 31 have been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over *Havemann*, and claims 30 and 31 have been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over *Havemann* in view of U.S. Patent No. 5,317,192 (*Chen et al.*). Applicant respectfully traverses these rejections. Because independent claim 28 is believed to be allowable over the prior art of record, dependent claims 29-33 (which depend from independent claim 28) are allowable as a matter of law for at least the reason that each of the claims 29-33 contains all the elements/features of independent claim 28.

### **5. Claim 34**


Claim 34 has been rejected under 35 U.S.C. 102(e) as allegedly being anticipated by *Drynan*. Applicant respectfully traverses this rejection. For a proper rejection of a claim under 35 U.S.C. Section 102, the cited reference must disclose all

elements/features/steps of the claim. The Examiner has failed to specifically point out how each element or feature of claim 34 is anticipated by *Drynan*. Applicant respectfully submits that claim 34 is allowable for at least the reason that it includes "a second metal layer formed over and in direct contact with the dielectric layer," a feature that is not taught by *Drynan*. Therefore, since the cited reference does not disclose all the elements and/or features of claim 34, Applicant respectfully asserts that the rejection should be withdrawn.

### **CONCLUSION**

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all rejections have been traversed and/or accommodated, and that the pending claims 16-34 are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,

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**ANNOTATED VERSION OF MODIFIED CLAIMS TO SHOW CHANGES MADE**

16. (Once Amended) An interconnect comprising:

- (a) one or more metal lines formed from a first metal layer, said metal lines having gaps therebetween;
- (b) low-k material filling the gaps between the metal lines and having a height and one or more vertical portions;
- (c) a protective layer formed over the metal lines and the low-k material, wherein the protective layer covers at least one vertical portion of the low-k material.
- (d) a dielectric layer formed over the protective layer, wherein the dielectric layer has a different composition than the low-k material;
- (e) one or more vias etched in the dielectric layer;
- (f) a metal for filling the vias;
- (g) a second metal layer formed over the dielectric layer; and
- (h) one or more openings in the protective layer for allowing the metal vias to contact the first metal lines.

28. (Twice Amended) An interconnect structure comprising:

- a plurality of metal lines formed on a substrate;
- low-k dielectric structures interposed between two or more of said metal lines;
- a second dielectric material formed above said metal lines, wherein portions of said second dielectric material are formed between portions of said low-k dielectric structures;
- a protective layer interposed between said low-k dielectric structures and said second dielectric material, wherein said protective layer is configured to provide etch selectivity between said protective layer and said second dielectric material; and
- a conductive feature formed within said second dielectric material and said protective layer, said conductive feature in contact with at least one of said plurality of metal lines.